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Corporate Recruitment and Networks in Germany: Change, Stability, or Both?

Elena Semenova *

Abstract: »Die Rekrutierung von CEOs und ihre Netzwerke in Deutschland: Wandel, Stabilität, oder beides?«. This article analyzes the recruitment of CEOs at the 100 largest German companies, focusing on how the transition from "Deutschland AG" to integration with European and global markets has impacted the recruitment and career patterns as well as networks of German CEOs. This study found signs of both continuity and change. The percentage of technically educated German CEOs, as well as CEOs with a Ph.D., continues to be quite high. In contrast, the professionalization of managerial positions in Germany, the decline in corporate tenure, and a gradually opening recruitment market reflect the changing orientation of German corporate culture toward international markets. The analysis of the overall corporate network and its components reveals that the density of the overall corporate network in Germany has increased, which corresponds to the increased number of CEOs with shared alumni experience as well as with additional connections through various policy associations. The density of co-worker networks has, however, decreased. The structure of the German corporate network is not unified but consists of a set of highly dense groups (cliques). The findings and their implications for further research on change in German corporate structures are discussed.

Keywords: Economic elite, CEO, manager, career, connection, Germany.

One of the most fundamental issues in elite studies is the power of economic elites. It is widely recognized that managers, owners or major stockholders of the largest national and international enterprises (e.g., Bill Gates of Microsoft or Mark Zuckerberg of Facebook) exercise considerable political power as a result of their economic power. They are also an essential element of the overall power structure of contemporary capitalist societies. It is also assumed that these elites are not cohesive; they compete with one another in the pursuit of their specific interests. Moreover, they compete with political elites, and, at the same time, neither can exist without the other [‘a dissociative symbiosis,’ as Best called it (2019, 45)]. In the context of this HSR Special Issue, this article deals with the overall structure of economic power in Germany by focusing on

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corporate (economic) elites, i.e., CEOs of the largest national and international enterprises.

1. Capitalism: German Style

The literature on comparative capitalism treats Germany as a prominent example of an “institutionalized high-wage economy” (Streeck 1997) or “Rhenish capitalism” (Windolf and Nollert 2001; Albert and Gonenc 1996), which differs pronouncedly from American “liberal market economy” (Hall and Soskice 2001, 21-33). Specifically, in the Federal Republic of Germany, a specific set of formal and informal institutions (e.g., socially instituted markets and negotiated firms with a long-term attachment of labor and capital) emerged in the postwar period and gave rise to what has been called diversified quality production (Streeck 1997). This system was driven by three principal factors: large banks with an eye to long-term investment rather than short-term profit, incremental innovation of products, and labor unions whose strength and role in management contributed to relatively high wages.

This successful corporate model, which prevailed until the early 1990s, is generally referred to as “Deutschland AG” (“Germany Inc.”). Deutschland AG was considered highly stable because strong ties between companies in the industrial and financial sectors (Windolf and Nollert 2001) were a safeguard against such threats as hostile takeovers. Moreover, companies’ long-term main banks provided them with the capital they needed. Company shares were usually divided among few major blockholders. Finally, industrial relations were built on an elaborate system of supervisory boards and workers’ councils, which promoted a culture of consensus (Lütz and Eberle 2007). These industrial relations were also backed up by a system of wage autonomy, which led to the introduction of collective agreement on wages (Streeck 1997, 2006). In sum, in this environment of cooperation and shared economic prosperity rather than maximization of individual profit, companies in Deutschland AG were able to pursue long-term development strategies and concentrate on the production of high-quality goods.

With the integration of the German economy into the European and global markets and later German reunification, Germany’s corporate environment has had to adjust to new market realities, leading some scholars to talk about the ‘crisis’ of Deutschland AG. Specifically, the growing disengagement of financial companies from the national company network has weakened the density of company ties (Höpner and Krempel 2006). Also, hostile takeovers have become more frequent (Streeck 2006; Lütz and Eberle 2007). Companies have shifted their interests toward profit maximization, gradually adopting strategies to increase their market capitalization (Höpner 2001). These changes in corporate strategies have accompanied transformations in industrial relations: trade

unions now struggle with a decline in membership and a diminution in the power of collective agreements (Doellgast and Greer 2007). All of these changes in the corporate culture and corporate financing systems have affected German companies.

How this market integration has affected Germany's corporate culture and corporate environment, including recruitment patterns and career trajectories among Germany's top managers, is an area of some disagreement among researchers. Some have argued that despite the inevitable impacts on the corporate environment and company strategies, corporate recruitment in Germany is characterized by impressive stability (e.g., Gergs and Schmidt 2002; Hartmann 2006). Others have discovered notable changes in corporate recruitment and linked them to the crisis of Deutschland AG (e.g., Höpner 2003).

The available data has been used to support arguments on both sides of this issue. In this article, I provide new data on the recruitment of chief executive officers (CEOs) from the 100 top companies in Germany in the 2010s in order to evaluate the degree to which recruitment and career patterns of top managers have changed but also to some degree remained the same in the wake of the "crisis" of Deutschland AG. The results of this study will be presented in light of existing scientific discourse on corporate recruitment in Germany.

In addition to the analysis of corporate recruitment, my analysis takes into account the structure of corporate networks in Germany, which will be examined by Social Network Analysis (SNA). Network analyses of corporate governance in Germany have primarily dealt with the question of networks between financial and industrial companies (e.g., Höpner and Krempel 2006) and interlocking directorates – i.e., the practice of serving on multiple corporate boards, a widespread phenomenon among German corporate board members (Ziegler 1981; Albach and Kless 1982; Pappi, Kappelhoff and Melbeck 1987; Windolf and Nollert 2001; Entorf et al. 2009; Pfannschmidt 1993). Studies have revealed that the personnel and financial networks between the industrial and financial sectors in Germany are strongly interconnected. However, in this study, I will take into account an aspect of corporate networking that has been overlooked in existing studies, despite its apparent significance: networks among top German CEOs that have to do with ties other than those of interlocking directorates. This analysis will address this blind spot in the existing research by analyzing various kinds of networks among German CEOs and providing a broader and more nuanced look at changes to corporate networks in post-Deutschland AG.

This article consists of four sections. After the introduction in section 1, section 2 gives a brief review of the literature on corporate recruitment in Germany. Section 3 presents an empirical analysis of the recruitment patterns among German CEOs, with a focus on four aspects of corporate recruitment: educational levels attained by CEOs, the frequency of in-house careers, CEO candidates' working experience, and their career tenure (e.g., Hartmann 1996; Freye

2010). Section 4 presents an empirical analysis of a variety of networks among the nation's top CEOs with an eye to attaining a deeper perspective on the corporate network structure in Germany that goes beyond a consideration of interlocking directorates. After a discussion of the results of the analysis, I will conclude with the insights gained from looking at a variety of forms of networking that have emerged within Germany's changing corporate culture. As I will argue, the recruitment patterns and networking as seen from these additional angles reflects movement away from some of the principals of Deutschland AG but at the same time signals a hesitancy toward simply adopting the Anglo-Saxon corporate model.

2. Studies on the Recruitment of Germany's Managers

One of the most prominent approaches to studying German corporate leadership is to focus on company managers and board members, who are defined as the most powerful sectoral elites (Hartmann 2018, 398). From the 1950s to the 1970s, elite studies focused on the recruitment and attitudes of corporate elites, looking particularly at social background (and *habitus*), educational background, and the career patterns of managers and corporate leaders (Hartmann 1956; Pross and Boetticher 1971; Kruk 1972). This type of study was less common during the 1980s (Poensgen and Lukas 1982) but has experienced a resurgence in the 1990s and 2000s (Hartmann 1996, 2006; Gergs and Pohlmann 1999; Gergs, Hausmann, and Pohlmann 1997; van Veen and Elbertsen 2008). Research on economic elites has shown that German managers are often recruited from families with a high socio-economic status (Hartmann 2006). Top positions in corporations are almost exclusively controlled by men, as is also the case in France, the UK, and Spain (Hartmann 2018, 407). German managers typically have educational backgrounds in the technical sciences and have pursued in-house careers within the same company (Hartmann 1956; Hartmann 1996).

The major shortcoming of these studies focusing on corporate leaders is that they usually ignore possible connections between the type of national economy in which these leaders operate and the recruitment features of economic elites that are specific to those economies.

Sociological management studies have done a better job than elite studies when it comes to explicitly connecting specific types of national economies to the kinds of managers that succeed within those economic models. In particular, sociological management studies have highlighted the interrelation between company structure, company environment, type of production regime, and the careers of managers in different production regimes. Within this line of research, many cross-national studies on economic elites have been conducted, creating the basis for identifying differences in the recruitment and career pat-

terns found among managers in Germany (and Continental Europe) vs. their Anglo-Saxon counterparts (Glover 1976; Maurice, Sorge and Warner 1980; Egan 1997; Windolf 2003). The biggest shortcoming of the sociological management literature has been its focus on national settings at a specific period in time. These studies have therefore failed to take into account the significant factor of changes in corporate strategies within the respective countries.

Economic sociology offers an approach that overcomes this shortcoming by considering the formation of corporate leadership within specific national settings from a longitudinal perspective. Most researchers in economic sociology have focused on the notion of corporate control and its importance for the way corporations function (Fligstein 2001). When changes occur that affect the understanding of who is in control in a particular corporate environment, those changes trigger expectations among managers concerning the kinds of prerequisites they will need to fulfill in order to meet current and future challenges (Franks and Mayer 1990; O'Sullivan 2001). Studies on corporate control in Germany have discovered that German companies are highly interconnected through the system of interlocking directorates, and many companies are family owned (Fohlin 2005). A shortcoming of economic sociology literature is that it mostly neglects important connections between models of corporate control, the economy, and recruitment of economic elites.

Researchers focusing on the highest echelons of corporate elite have argued that although the corporate environment has changed since reunification, recruitment patterns of top managers have altered less than one might expect. For example, Gergs and Schmidt (2002) have highlighted the remarkable stability of German managers' career patterns. In particular, they have stressed the persistence of technical expertise and the dominance of in-house careers. Hartmann (2006) has also generally painted a picture of continuity in the recruitment patterns, although his findings do suggest that some of the recruitment patterns of German managers have changed; in particular, the proportion of CEOs with typical in-house careers has decreased, as was also the case with CEOs educated in law. Thus even researchers such as Hartmann (2006, 452-4) who point to signs of continuity generally agree that Deutschland AG has been experiencing a massive pressure for change and that this pressure has changed the overall corporate environment.

Economic sociologists who have analyzed the changes in the professional background of German top managers have concluded that increasingly market-oriented corporate strategies have led corporate elites to become more professionalized and more subject to competition. Specifically, Höpner (2003) and Freye (2010) have highlighted the growing proportion of CEOs educated in economics and the gradual opening of the corporate recruitment market to external contenders. The declining tenure of CEOs also signifies the increased competition for leading positions. Höpner (2003, 133-4) argues that the changes in management recruitment stem from the changes in corporate strategies,

which have moved from stakeholder value to shareholder value. Beyer (2006), in a study of the 100 largest companies in Germany in 2003, found that companies run by CEOs with backgrounds in finance were less strongly integrated into the German company network than those run by managers with technical educations. From this he concluded that the growing recruitment of managers with finance backgrounds contributed to the crisis of Deutschland AG by introducing new corporate strategies.

3. The Path to Becoming a CEO in Germany: Analysis of the Recruitment Patterns

3.1 Educational Backgrounds of CEOs

Researchers studying corporate recruitment in Germany have highlighted a unique pattern in the educational qualifications of German CEOs that has distinguished them from their Anglo-Saxon counterparts: a preponderance of managers with technical expertise. This dominance of technically trained German managers was identified as early as the 1950s (Hartmann 1956) and has continued to exist after reunification (Egan 1997). The emergence and persistence of this recruitment pattern were related to both the German innovation regime (Hall and Soskice 2001, 1-68) and the German type of capitalism (Streeck 1997). Since the 1980s, researchers have observed a change in the corporate discourse; namely, a shift took place from an emphasis on incremental technical innovation involving high-tech products to a focus on benchmarking and financial performance (Münch and Guenther 2005). This change has led to an increasing pattern of recruiting financial specialists to the highest corporate ranks. The question that arises is whether this educational recruitment pattern prevails into the 2010s.¹

In general, corporate leaders in Germany are highly educated (Table 1), and a university degree is considered a prerequisite for senior managerial positions (cf. Hartmann 1996). A noticeable proportion of the CEOs in the data had PhDs.

¹ The companies analyzed here are taken from a list of the 100 largest (most profitable) companies in Germany, annually published by the *Frankfurter Allgemeine Zeitung* (FAZ). I selected the largest companies because I assume that large and economically profitable enterprises have a greater impact on economic processes in their country than their smaller counterparts. The CEOs of the selected companies were identified by checking the respective company reports. Other sources of information used include the Munzinger database, issues of *Wer ist Wer?* (the German *Who's Who*), information provided by the companies, and newspapers. In total, data were collected and coded for 100 individuals regarding their career paths (if possible, since their university education) and the networks in which they were active before assuming a CEO position in one of the top companies. The cross-sectional data set includes two observation points – the years 2012 and 2015.

Following Freye (2010), we used a CEO's engineering or science degree as a proxy for his or her technical expertise and a degree in business studies or economics as a proxy for financial expertise. Because of the developments in the corporate culture of Germany, which has become more oriented toward financial markets, one might expect that the proportion of CEOs with degrees in engineering/science should decrease while the proportion of those with degrees in business administration/economics should increase. Based on her sample of CEOs from the 50 top enterprises, Freye discovered that during the period 1960 to 2000, the proportion of CEOs with degrees in engineering/science continually exceeded the proportion of those with degrees in economics. Strikingly, during the period from 2000 until 2005, the leading positions in German industry are more dominated by people with academic backgrounds in engineering and science than in the 1970s and early 1980s (Freye 2010, 17-8).

Table 1: The Major Recruitment and Career Patterns of German Top-Managers

Variable	Freye (2010)				Semenova	
	1990	1995	2000	2005	2012	2015
Educational background (in %)						
CEOs with university degree	N/P	N/P	N/P	N/P	81	87
CEOs with Ph.D. degree	N/P	N/P	N/P	N/P	36	37
Technical/scientific degree	26	35	49	54	35	40
Degree in economics/finance	60	56	34	42	47	50
Degree in law	32	21	21	8	5	9
In-house careers (in %)						
CEOs recruited from within their company (in %)	N/P	N/P	N/P	N/P	31	27
CEOs recruited from within their corporate group (in %)	N/P	N/P	N/P	N/P	61	65
CEOs with working experience abroad	N/P	N/P	N/P	N/P	55	59
Professionalization						
Position from which a CEO was recruited (in %)						
CEO position	N/P	N/P	N/P	N/P	28	39
Vice-CEO position	N/P	N/P	N/P	N/P	17	N/A
Member of the executive board of directors	N/P	N/P	N/P	N/P	48	51
Age at which candidates got their first-ever CEO position (in years)	46.3	47.2	45.3	45.5	48.5	49.1
Age and tenure						
Age at time of the recruitment (in years)	51.1	52.2	52.4	50.7	55.0	54.0
Mean tenure (in years, standard deviation)	9.9 (N/P)	9.0 (N/P)	8.4 (N/P)	N/P	4.3 (11.0)	5.5 (3.7)
N	50	50	50	50	100	100

Note: N/A – not applicable, N/P – not provided.

Source: author's own calculations and Freye (2010).

The current study reveals that these tendencies have slightly changed during the 2010s. In 2012 and 2015, half of all CEOs held university degrees in economics/business studies, while the proportion of those with degrees in engineering/science was as high as 40%. Although the number of technically educated CEOs seems to have decreased slightly, technical expertise is still widespread among German corporate leaders.

In contrast, legal backgrounds have become less common among German CEOs. From the 1950s until the early 1990s, the proportion of CEOs with legal degrees equaled that of CEOs trained in economics – approximately 30% (Freye 2010, 18), although this proportion decreased during the 1990s (Hartmann 2006, 445). Our results support these findings. By 2015, less than 10% of CEOs held a law degree.

In sum, compared to earlier generations of German corporate leaders, the current managers of the largest companies tend to study economics and business instead of science and law. This shift in the educational credentials of top managers reflects a change in the corporate requirements of experience and knowledge among senior managerial personnel (Münch und Guenther 2005; Höpner 2003; Gergs and Schmidt 2002).

3.2 The Closed Corporate Recruitment Market

Educational background was not the only feature distinguishing German CEOs from their Anglo-Saxon counterparts. Another feature was the impact of seniority and company loyalty on CEO appointments (Windolf 2003). German managers typically rise through the ranks in one company, slowly climbing the corporate ladder and eventually becoming CEO. The dominance of in-house recruitment for corporate leaders, which began in the 1980s and continued into the 1990s and the 2000s (Hartmann 2006), is a typical feature of German managerial selection. The integration of the German economy into European and world markets would be expected to decrease the opportunities for in-house careers and to internationalize corporate personnel, as has been the case in Anglo-Saxon countries and France (Hartmann 1996, 71-2).

Against these expectations, the German corporate market has remained relatively closed, meaning that the majority of German managers are native Germans. For example, in the 2015 sample, 76% of CEOs were born in Germany, with an overwhelming dominance of managers from Western Germany (more than 98%). The remainder was born abroad, with approximately 5% hailing from the Netherlands and another 3% from the UK. Using work experience abroad as an indicator of internationality (Hartmann 2018, 410), we can conclude that German CEOs have become more mobile than was previously the case. In 2015, approximately 60% of German CEOs had gained working experience abroad, although most of these sojourners were employed in an office of their home company or home company group abroad.

This internationalization of corporate elites notwithstanding, the most specific feature of corporate recruitment in Germany has been and remains the frequency of in-house careers (Hartmann 1996, 71; Höpner 2003, 124). According to Freye (2010), from 1980 until 2000, approximately 60% of all German CEOs pursued typical in-house careers. These results come with an important caveat. With the diversification of production and the changes in corporate structure in Germany, more corporate groups (i.e., collections of parent and subsidiary corporations that function under one source of control) have emerged. One can expect that this development will lead to the less frequent occurrence of in-house careers. Freye (2010, 21) has shown that until the late 1980s, most in-house managers were recruited from within their companies, but since the 1990s, that proportion had decreased while the proportion of those recruited from within their corporate groups increased. Our findings confirm this trend. In 2015, only 27% of German CEOs of the top 100 companies were drawn from within their companies, but this proportion increases to as high as 64% if we consider those top managers who were recruited from within their corporate groups (Table 1). An additional aspect of in-house careers is the average number of years a candidate spends in the company or corporate group before assuming a corporate leadership position. In 2015, CEOs had to work in their companies for a full 16 years (the standard deviation is 11 years) before being promoted to their current positions. The high standard deviation signifies that there is not the easy route into German management.

These findings reflect two significant trends. The first one is that the recruitment market for CEOs of German companies is still relatively closed. The dominance of CEO candidates from the same company or corporate group is an indicator of the high value placed upon company loyalty and seniority for corporate recruitment. It also may be considered a hindrance to the development of an external recruitment pool (Höpner 2003). The second tendency (i.e., the decreasing proportion of managers recruited from within the same company in favor of those recruited from within the same corporate group) reflects the growing structural differentiation between parent and subsidiary firms, which has provided more opportunities for employees to move from one department to another (Freye 2010).

3.3 Professionalization among Corporate Managers

In addition to in-house promotion, another essential aspect of corporate recruitment is the growing professionalization of top managers. One of the indicators of this process is the restricted mobility of candidates for CEO positions across different positions. Both in 2012 and 2015, half of all CEOs of top German companies were drawn from executive boards of directors where they served as members (Table 1). The proportion of those who had held a CEO position in the same or another company group before their recruitment in-

creased from 28% in 2012 to 39% in 2015. In contrast to the corporate recruitment in 2015, in 2012, approximately 17% of CEOs were promoted from vice-CEO positions. Finally, in 2015, some 4% of CEOs were the owners of their respective companies.

The average promotion period between the first CEO position a candidate ever assumed and the CEO position in one of 100 top companies in Germany should also be taken into account. According to Freye (2010, 22), the average age at which managers had assumed their first-ever CEO positions declined from 51 years in 1960 to 46 years in 2005. In our study of managers of the top 100 German companies, managers had assumed their first senior executive positions at an average age of 50.

Combining these findings with the data on the prevalence of in-house promotion, we find that the average career of a top-level manager in Germany unfolds within one company or corporate group, where future managers begin working in their late thirties. Eventually, the most talented managers are promoted to CEO positions in subsidiary companies in their early fifties. To become CEO of one of the 100 largest German companies, a candidate should be able to demonstrate a record as a successful CEO. Over time, this requirement becomes easier to fulfill because of corporate decentralization by large companies. They often reorganize into parent and subsidiary companies, with the latter run by independent CEOs. This change in corporate structures increases the number of available CEO positions and intensifies the competition among CEOs of subsidiaries and parent companies for the position of company group head (Freye 2010, 23-4).

3.4 Age at the Time of Appointment and Average Tenure

The dominance of in-house careers in German companies was named one of the reasons for a relatively high average age of CEOs at the time of their appointment. During the 1960s and 1970s, the average appointment age of German managers was above 50, while their American counterparts assumed their positions in their early forties (Kruk 1972). Researchers highlighted, however, that although German CEOs were on average older than their counterparts in the US, their tenure as a CEO was also longer (Egan 1997, 5), which comes as no surprise considering the closeness of the recruitment market and high entry requirements for potential candidates.

Freye (2010, 22) has noted that during the period from the 1960s until the early 2000s, German CEOs were on average 51-53 years old while being recruited to their positions as managers of the 50 largest German companies. The dominance of middle-aged corporate leaders was a trend that has been evident since the 1960s; moreover, the standard deviation of the average age has been declining since the 1980s.

Because of the changes in corporate culture in Germany (among others, the orientation toward performance rather than seniority), one might expect the average age of CEOs, as well as their tenure as CEO, to decline. But based on our data, this expectation cannot be empirically confirmed. In 2015, the average age of German CEOs was 54–55 years, with a standard deviation of six years.

However, the second assumption (i.e., the expectation of a decline in corporate tenure) can be confirmed. According to Freye (2010, 24), between the 1960s and 1980s, the tenure of the average CEO fluctuated between 11 and 12 years, decreasing to eight years in 2000. In our study, the average tenure fluctuated between approximately four years (in 2012) and six years (in 2015). Although some of the corporate careers examined in the sample are still ongoing, the data from two cross-sectional observations suggest that in the 2010s, the average tenure of a CEO of a top company matches the average duration of a CEO contract (i.e., five years). The study on managers' success by PWC Strategy& (2018) has found out that the average tenure of German CEOs has declined from 8.4 years (2016) to 5.1 years (2017). In contrast, in 2017, the average tenure of a CEO around the world has been approximately seven years.

The decline in the average CEO tenure at the top 100 German companies mirrors the changes in the corporate environment's structure of opportunities. In the early observation years (1960–1980), more prolonged CEO tenures were related to the flat hierarchy of German companies, in which boards of directors share collective responsibility (Streeck 2006, 165). The development of clear hierarchies within companies and increased prominence for the CEO in the decision-making process (following the Anglo-Saxon model; Jackson and Höpner 2001) has tied the CEO's fate with corporate performance. This change negatively affected the tenures of German CEOs in the 2000s and 2010s. These results were supported by the PWC Strategy& study (2018), according to which one in ten German CEOs has lost his or her position because of bad financial performance.

4. The Structure of the Corporate Network in Germany: A Social Network Analysis

Having analyzed recruitment patterns of German CEOs, we turn now to the structure of German corporate networks. Specifically, the methods of Social Network Analysis (SNA) will be used to examine a variety of ties between CEOs. The instruments of network analysis have been little used to study German corporate careers or corporate governance in general (Entorf et al. 2009, 1116). Most of the existing studies using SNA have dealt with the issue of interlocking directorates (e.g., Kengelbach and Roos 2006).

Method and data: We will study the ties between CEO candidates based on a structural approach. In this article, four types of ties between the CEOs will be studied. All ties are defined in advance and will be measured for each CEO in order to avoid selection bias (Keller 2018). Two types of ties are related to the experience of the candidates before their recruitment: alumni-network ties (e.g., education at the same university or participation in the same vocational training) and coworker ties resulting from working experience in the same company (or in the same company group). In addition to ties based on shared experience, we will take into account ties based on policy-relevant networks through which the candidates connect with colleagues across companies and economic sectors. These policy-relevant network ties include connections through membership in nonprofit organizations (e.g., the board of trustees or advisory board of a museum or gallery) and memberships in various think tanks.

Measuring networks through the aforementioned ties has certain shortcomings. Most importantly, it is not a precise way of inferring actual trust ties: members of the same company may have been competitors; students from the same university may in fact never have met during their studies; members of the same think tank may pursue different interests. Although this measure is imprecise for the capture of trust ties or reputational networks, it does not produce a systematic bias that would impact a study of the overall structure of the network (Keller 2018).

For the purposes of this SNA, the data collected on the recruitment of German CEOs in 2012 and 2015 were coded in a format that facilitates analysis using UCInet software (Borgatti et al. 2002). The connections between the CEO candidates were coded as present or absent (using binary variables) if two candidates had gained experience at the same organization (e.g., the same company) during his or her career. The noteworthy shortcomings of this coding is that the direction of the ties (i.e., whether the candidates knew each other equally or one had more knowledge of the other) and the strength of ties (i.e., whether or not the connection was very friendly) were not taken into account. Although this information may provide additional insights into the value of networks for the recruitment of German CEOs, its collection involves the use of in-depth interviews of elite members, which may lead to a systematic bias in the selection of the respondents.

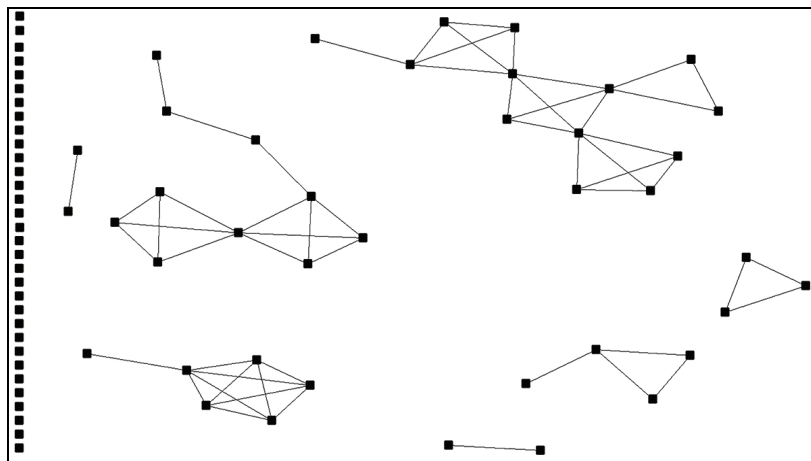
4.1 Four Types of Networks of German CEOs

This section presents different types of networks that are relevant for CEOs' career paths, along with the essential characteristic of each network.² Alumni

² The examined networks will be visualized using the NetDraw package of the UCInet (Borgatti 2002). The individuals' positions in the figures presented in this article are generated

networks, which consist of ties based on shared college or university attendance, are low-density. Their density (i.e., the proportion of all possible dyadic connections between actors that are actually present) is as high as 0.02 (i.e., 2%), although compared to 2012, the number of alumni ties in 2015 is slightly higher (Figures 1 and 2). The largest component of this network includes alumni of four German universities: the RWTH Aachen, Ruhr-University of Bochum, University of Münster, and University of Cologne. Some researchers attribute the low importance of alumni connections for corporate recruitment in Germany to the absence of elite universities in Germany (Hartmann 2018).

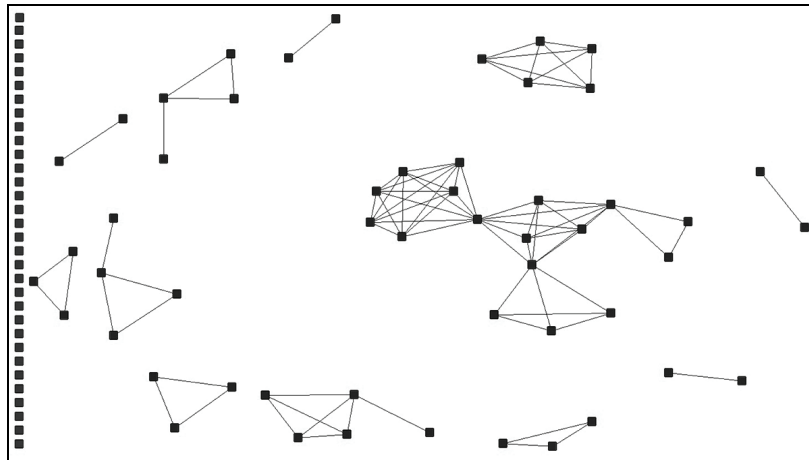
Figure 1: University Networks of German CEOs in 2012



Source: author's own calculations.

by the graph-theoretical layout "Spring Embedding". The algorithm uses iterative fitting (i.e. start with a random graph, measure fit; move some node, measure fit again and so on) to locate the points in such a way as to put those with smallest path lengths to one another closest in the graph. Two nodes are "similar" if they have similar shortest paths (geodesic distances) to all other nodes. The geodesic distance is the number of relations in the shortest possible walk from one actor to another. For a better visualization, I used the optional "node repulsion" criterion that creates separation between nodes that would otherwise be located very close to one another. The absolute location of the nodes (left-right, top-down) does not have any specific meaning, similarly to the position of isolates (nodes without any connections).

Figure 2: University Networks of German CEOs in 2015



Source: author's own calculations.

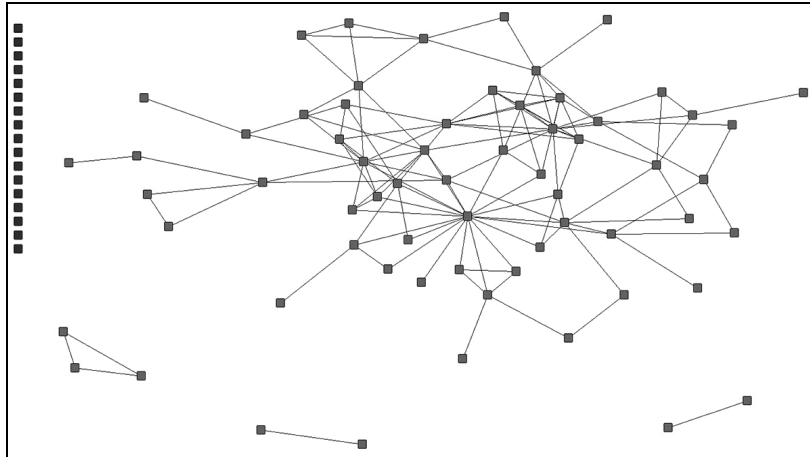
In contrast, the networks of co-workers (i.e., ties between those who have worked in the same company or corporate group during their earlier careers) have become less dense over time (Figures 3 and 4). While in 2012, the average number of co-worker ties for each German CEO was as high as 3.2, it decreased to 2.1 in 2015. The density of this kind of network decreased from 0.04 to 0.02. Although these densities appear to be low, it is still noteworthy that over the course of their careers, German CEOs shared a working environment (a company or a corporate group) with a fellow CEO at least twice.

Such a massive change in co-worker networks from 2012 till 2015 may be an indicator that Deutschland AG slowly disintegrates. Different branches of industry are building their networks, which increases the segmentation of co-worker network. Another structural change that plays a crucial role in network disintegration is globalization. Even in international comparison, the proportion of German CEOs who had gained international experience before their recruitment is high (compare, PWC 2018). Unfortunately, international networks of CEOs were not captured in this study.

Moreover, in the world comparison, careers of German corporate elites are highly volatile. Corporate turnover in Germany stems from both regular (i.e., the end of CEO's contract), corporate (i.e., turnover due to a merger between two companies or takeover), and economic (e.g., bad financial performance) reasons (compare, PWC 2018). Moreover, some CEOs resigned because of scandals, as was the case with Martin Winterkorn, former CEO of the Volkswagen AG and Porsche Automobile Holding SE. This manager was the most central in German corporate network – both in the number of direct ties and in his betweenness position in the overall network and his removal has

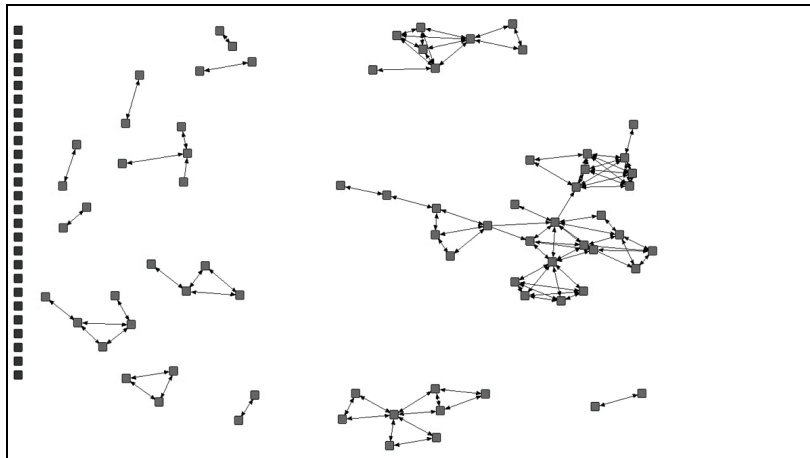
reduced the overall network density. Because of a massive turnover, in 2015, the co-worker network consisted of a set of highly dense groups (cliques) and numerous isolates, i.e., CEOs without any connections to other network members.

Figure 3: Coworker Networks of German CEOs in 2012



Source: author's own calculations.

Figure 4: Coworker Networks of German CEOs in 2015



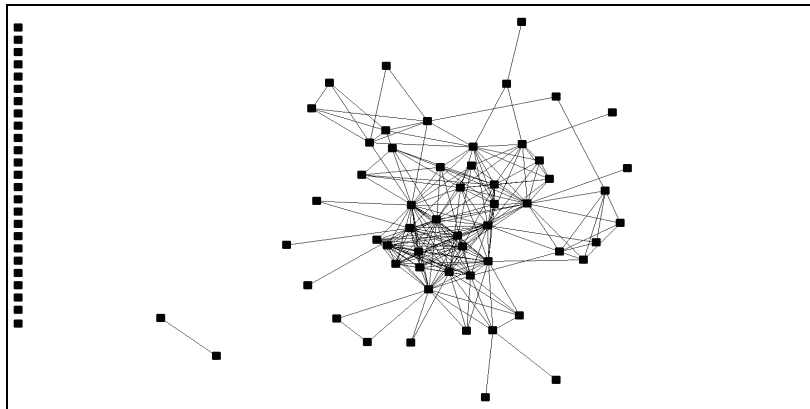
Source: author's own calculations.

Studying policy-relevant networks, the density of ties through the same NGOs is even lower than those of alumni networks (0.01), with the decrease in the

average number of ties from 0.4 (2012) to 0.2 (2015). Surprisingly, the engagement of German CEOs in various non-profit organizations and boards of universities, museums, and foundations was relatively low and even decreased over time. In contrast, the CEOs of American companies actively use the instrument of “strategic philanthropy” (Saiia et al. 2003) to provide positive news about their companies and to realize their strategic interests. In his analysis of corporate philanthropy, Fifka (2013) discovered that compared to the US system, in which “giving back” behavior among large corporations is culturally and politically desirable, in Germany, corporations rely on income redistribution and taxation as important instruments of support that replace the need for philanthropy. This may account for the low levels of participation of German CEOs in non-profit organizational networks.

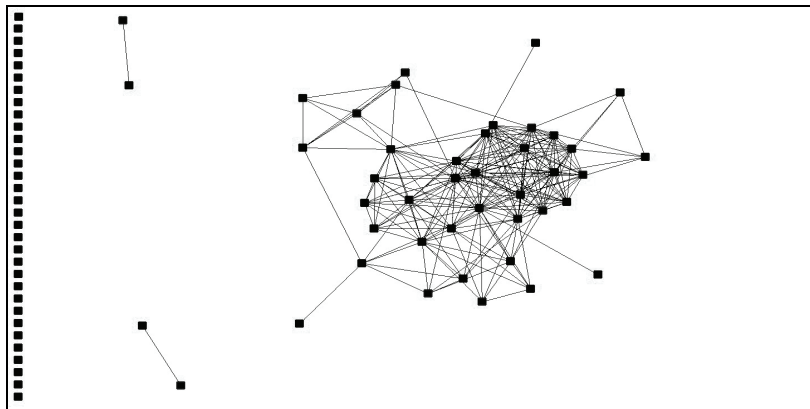
Out of all analyzed networks, the one with the highest density is based on ties through participation in the same think tank or policy association. In the 2012 think-tank networks, a CEO shared on average 5.8 ties with other CEOs, while in 2015, the average number of ties decreased slightly to 4.8 (Figures 5 and 6). The density of this kind of network was as high as 0.05-0.07. The range of policy-oriented think tanks and policy-relevant associations includes the *Atlantik-Brücke* (the private and non-profit organization with the goal of strengthening relations between the US and Germany), various associations (e.g., of the automobile and chemical industries), and various entrepreneurial organizations and think tanks, both at the national and European levels. Active participation of top managers in various policy organizations results from many reasons. Organizations such as the *Atlantik-Brücke* allow corporate and political elites to build networks; members of the *Atlantik-Brücke* have included the Chancellor of Germany, Angela Merkel, as well as acting and former ministers and parliamentarians of the European Parliament and German Bundestag. Moreover, this organization includes high-ranking members from the US, providing an additional incentive for top managers of German “global player” companies to join. Participation in different policy associations establishes ties across industries and within industries. It also supports the diffusion of innovations and contributes to the lobbying activities of companies (Ronit and Schneider 1998).

Figure 5: Think-Tank and Policy-Association Networks of German CEOs in 2012



Source: author's own calculations.

Figure 6: Think-Tank and Policy-Association Networks of German CEOs in 2015



Source: author's own calculations.

Finally, Figures 7 and 8 present ties from all of the examined networks between German CEOs. As the figures show, the number of isolates (i.e., CEOs without any ties in any of the examined networks) has increased from 2012 to 2015 (partly because of massive fluctuation in German corporate leadership). The overall network, however, has become more compact (with a density of 0.03); in other words, the CEOs share more ties to each other. One can assume that CEOs may be engaged on different networks (e.g., policy organizations) in order to compensate for the dissolution of co-worker networks.

In addition to the overall structure of corporate networks (e.g., the number of ties in each network; Figures 7 and 8), the substructures of these networks

are of interest here – particularly extended dense clusters of people, referred to as “cliques.” These substructures are crucial for a better understanding of mobilization and diffusion as well as lines of cleavage within networks.

In all of the networks described above, in 2012, nine cliques were discovered. Interestingly, membership in these cliques is not exclusive, and some CEOs participated in two cliques. Nevertheless, the overall CEO network included two large groups consisting of four and two cliques respectively. The remaining three cliques had fewer members and set themselves apart from other groups. Of all of the CEOs from the top 100 companies, the core corporate elite consists of 29 people who are well-connected in the overall network. The density of this core of corporate elites is 0.06 (i.e., 6%), which is rather high. This core corporate elite comprises the significant brokers between different corporate groups and therefore enjoys a strategically prominent position in the network. These cliques consist of CEOs from different industries (such as the automobile industry, transport, and retail). The sector with the highest representation among these central CEOs is the energy industry (with six CEOs). One of the CEOs from the energy sector – Hans-Jürgen Brick (one of the members of the management board of the Amprion) – occupies a particularly important brokerage position by connecting two cliques to one larger clique. Four mostly central CEOs come from the chemistry industry, with Dr. Kurt Bock (the CEO of BASF) holding a prominent brokerage position.

Figure 7: The Overall Corporate Network of German CEOs in 2012

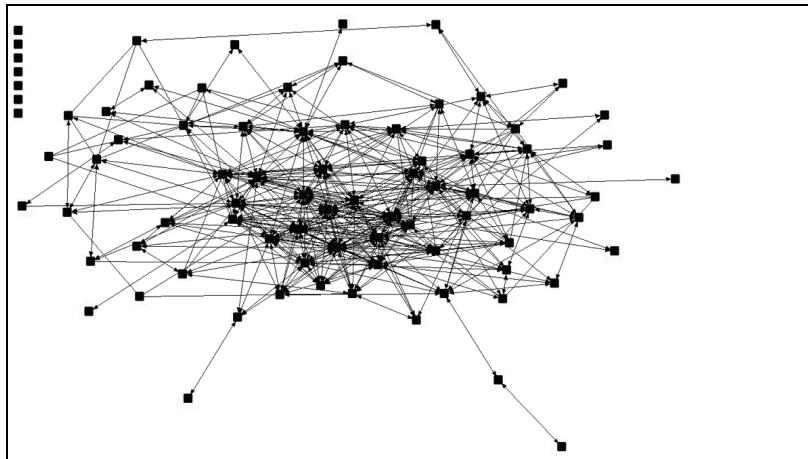
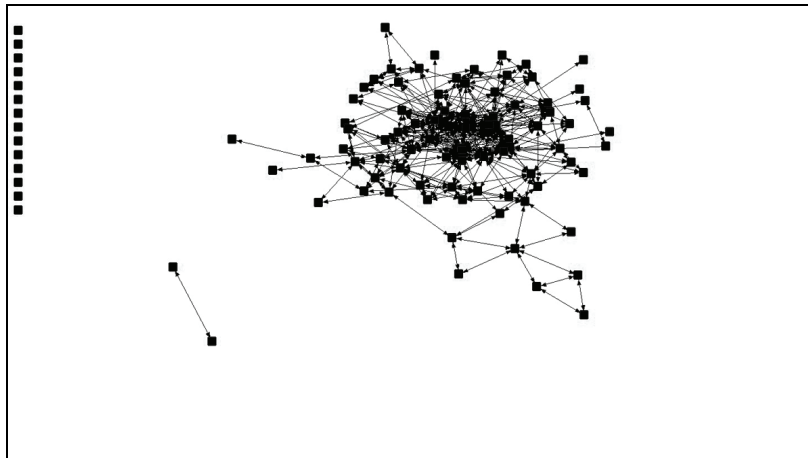


Figure 8: The Overall Corporate Network of German CEOs in 2015



The nature of the analyzed networks raises other questions about their impact on corporate managers' careers. For example, are two CEOs who share one of these kinds of ties also more likely to share other networks? One can assume that two CEOs who studied at the same university, later worked at the same company, and established ties with the same think tank (i.e., amassing common experiences) are likely to experience a sense of shared trust, making the establishment of further ties more likely. The hypothesis is, therefore, that the matrices of ties we examine will be positively correlated to each other. Based on the results of quadratic assignment procedure (QAP) correlation analysis (Krackhardt 1987), this hypothesis was partly supported. Of all the different ties described here, in 2012 the engagement of two CEOs in the same NGO significantly correlated with participation in the same think tanks (Pearson's $r = 0.16$, $p < 0.001$). In 2015, this correlation became marginally significant (Pearson's $r = 0.08$, $p < 0.01$). It is worth noting that alumni and coworker ties also correlated in both data sets, but the effect size was negligible in both cases.

5. Conclusion

This article analyzed the recruitment of CEOs at the 100 largest German companies, focusing on how the transition from Deutschland AG to integration with European and global markets has impacted the overall recruitment and career patterns of German CEOs. Taking into account the development of corporate recruitment patterns, this study found signs of both continuity and change. It was striking to note that the percentage of technically educated German CEOs was still quite high in the 2010s. At this point in time the German

corporate elite continued to resemble their political counterparts in that they were not only highly educated (Best, Hausmann and Schmitt 2000) but in many cases even had PhDs. In addition to providing new findings about the recruitment of CEOs, these results support the thesis of some researchers specializing in the corporate elite (in particular, Hartmann 2006) that German CEO recruitment practices have not undergone any radical changes.

Other results of this study are more in keeping with the expectations regarding changes in German CEO recruitment patterns in light of pressures on the corporate model from integration into the international market and reunification. German companies have become more oriented toward financial performance and benchmarking. This orientation has led to the increased recruitment of CEOs with an educational background in economics and finance, particularly in the late 2000s and 2010s. Moreover, the orientation toward markets and financial performance has contributed to the decline in the tenure of German CEOs in the 2010s compared to their counterparts in the 1960s and 1970s.

The professionalization of managerial positions in Germany and a gradually opening recruitment market also reflect the changing orientation of German corporate culture toward international markets. A proven track record as CEO or at least service in the executive board of directors has become an informal prerequisite for CEO candidates. The recruitment market for CEOs has opened up beyond in-house candidates only gradually, and mostly to include candidates from subsidiary companies within the same company group. This change came about as a result of German corporate decentralization in the late 1980s and 1990s. These findings support the argument about professionalization and marketization of corporate recruitment in post-Deutschland AG period made by some researchers in the field of economic sociology (e.g., Höpner 2003; Beyer 2006; Freye 2010). The long-term consequences of marketization and professionalization of corporate recruitment are likely to be more sustainable than patterns of continuity. If they become stable over time, one can expect the gradual creation of a new type of German capitalism, probably more comparable to the Anglo-Saxon model.

To look more deeply at the way corporate elites in Germany have structured in the 2010s, this study used a Social Network Analysis of Germany's corporate elite to focus on the overall corporate network and its components, including informal networking structures that influence career paths and recruitment. The study finds that the density of the overall corporate network in Germany has increased from 2012 to 2015, which corresponds to the increased number of CEOs with shared alumni experience as well as with additional connections through various policy associations. The structure of the corporate network is not unified but consists of a set of highly dense groups (cliques), in which members are more closely connected to each other than to other members of the corporate network who are not associated with these substructures. Cliques are central to the entire network and fulfill brokerage functions such as the

integration of the corporate network as well as the distribution of information and resources within the network.

According to the SNA, some of the networks (i.e., alumni and nonprofit groups) play a relatively inconsequential role in connecting German CEOs. The absence of elite universities in the German educational system means that alumni networks play a minor role among corporate elites in Germany compared to other countries (e.g., the UK and the US). The low participation levels of German CEOs in various nonprofit organizations (such as scientific foundations and boards of museums and galleries) indicate that philanthropy, too, is less essential in Germany than in countries such as the US, where philanthropy plays a central role in corporate image. Both findings underline essential structural differences between German and the Anglo-Saxon corporate cultures.

The coworker network, however, appears to play an important role in establishing ties between German CEOs. Considering the variety of companies and corporate groups operating within the German market, it is striking that according to the data for the two years selected (2012 and 2015), German CEOs on average shared at least two workplaces over the course of their careers. The most surprising finding from the network analysis was the high frequency of ties between CEOs because of joint participation in various think tanks and policy associations. On average, in 2012 and 2015, CEOs shared five to six policy association ties, which allowed them to establish connections both within and between different industrial sectors. Because in Germany, the proportion of political elites recruited from large enterprises has been low (Best et al. 2018), policy networks allow CEOs to establish ties between the corporate and the political elites in Germany and abroad. This finding may serve as an indicator of intense policy networking in the German political system.

This study provides a more nuanced view than has previously been available of what is behind the changes in the German corporate network and recruitment and career patterns of the country's corporate elite since the shift toward increased integration with international markets. The approach taken here opens up avenues for further research on change in German corporate structures. Using a controlled longitudinal study, it should be possible to establish more clear-cut connections between the changes in the corporate environment and the recruitment patterns of CEOs than have been found to date. A controlled longitudinal study would eliminate some of the bias and comparison problems in existing studies, many of which used different or even incompatible methodologies, examples, and observation periods. Social Network Analysis is an important tool for studying corporate structure in different contexts, but it is necessary to go beyond the existing studies on interlocking directorates and examine more closely how ties between CEOs emerge and change over time. For a better understanding of policy networks and their functioning in the German system, sector-specific ties, as well as ties among different industrial sectors, should be studied. The use of a reputational survey of German CEOs

would allow future studies to include a network analysis of trust and friendship ties between CEOs and how they affect corporate cooperation and performance. Taking into account these additional data sources would allow researchers to go beyond standard descriptions of recruitment patterns and open up “the black box” of corporate recruitment in the post-Deutschland AG period.

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